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they have a real and positive heredity even tho they are not species in the ordinary sense of the word. A lichen is a physiological species and not a species in the same sense as are *Linnaea americana*, *Cocos nucifera*, or *Agaricus campestris*. I have elsewhere suggested what I believe to be the controlling factors of lichen heredity and the development of new species of lichens. But the whole matter needs patient and prolonged investigation and would well repay the efforts of some students of genetics.

If a few members of the Sullivant Moss Society will take the trouble to record at stated intervals such data as readily lend themselves to exact measurement or definite experiment, they will be making a real contribution to our knowledge of these unique organisms.

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DR. CORREN'S INVESTIGATIONS AND STERILE MOSSES

JOHN M. HOLZINGER

In the fourth volume of *THE BRYOLOGIST*, January, 1901, the writer announced the discovery in Minnesota of *Webera prolifera*, a moss which in the fall of each year develops great numbers of gemmae, or bulbils, in the leaf-axils of the sterile plants. Since that time Dr. Corren's able work, *Investigations into Propagation of Mosses by Gemmae and Budding*,¹ has come to hand. With great diligence and care this author investigates 915 species. It is not generally known as it deserves to be, especially by the younger moss students, that the result of these studies has more than a passing importance for systematic investigations. Dr. Correns has a chapter on the Use of Bulbils and Gemmae in Systematic Determinations (of sterile plants), which finds a happy illustration in two recent determinations; the one actually accomplished, the other verified, by the use of this book.

I had collected last summer a small, beautiful green, sterile moss, which puzzled and troubled me for quite a while. The curly leaves broke off with the greatest ease. A leaf section showed median guides. The slender leaf-points were papillose. Interspersed with the delicate plants were alga-like threads, larger than the protonema threads of *Ephemerum*. These, I have since learned, are Dr. Corren's "chloronema," formed from the protonema. The patches of this moss occurred on the bark at the bases of trees, usually birches. They frequently covered areas the size of two hands. Small patches interspersed, which looked like beautiful green velvet, on examination proved to be areas where the chloronema had completely displaced the leafy plants. These observations persuaded me that I had before me a small, sterile, *Dicranum*. On

¹Untersuchungen ueber die Vermehrung der Laubmoose durch Brutorgane und Steckinge. von Dr. Carl Correns, Jena, 1899. pp. 1-472 + i-xxiv.

turning to Correns, I made the plant with much confidence *Dicranum montanum*; comparison with herbarium specimens confirmed the determination.

The second case was that of sterile *Encalypta contorta*. I had determined the plant, but wanted assurance. Correns, page 98, promptly furnished it, picturing the brittle, brown, thread-like, "*Brutkoerper*" found so abundantly on this plant.

Corren's notable work will aid students in the determination of many sterile mosses.

WINONA, MINN.

HYMENOSTOMUM IN NORTH AMERICA

A. LEROY ANDREWS

1. Delimitation of the genus

Amongst many uncertainties in a perplexing group of moss forms, one fact is too clear to deserve to be obscured by unjustified taxonomic partitions: namely the close natural relationship of many species which have hitherto usually been divided among the genera *Astomum*, *Hymenostomum* and *Weisia*. As represented in the north temperate zone, where their types belong, practically all of their species show gametophytes with no essential difference and only a series of sporophytes representing such a close gradation of forms that not only are the species still debatable, but the genera are in each case connected by forms which can with about equal justice be placed in either genus. This is particularly true in Europe, whose moss-flora has been most intensively studied. The species generally known as *Hymenostomum rostellatum* (Brid.) Schimp. is as good an *Astomum* as an *Hymenostomum*¹ and its recent revival as a separate genus *Kleioweissia*² Bayr-hoffer, 1849, by Loeske³ would make matters worse rather than better. The case is not greatly different with the species of the tropics and the southern hemisphere. On what grounds Brotherus⁴ includes with *Hymenostomum* as distinct from *Astomum* the minute species *H. abbreviatum* (Thw. & Mitt.) Broth. from Ceylon and *H. subacaule* (Mitt.) Broth. from Ecuador⁵ is not readily evident.⁶ Before finishing his work he had apparently forgotten having thus disposed of

¹Cf. Limpricht in Rabenhorst, Kryptogamenflora, IV, I, 224. 1886.

²The above is the original spelling.

³Studien, 76. 1910. Bayr-hoffer, Übersicht der Moose, Lebermoose und Flechten des Taunus, 3. 1849; Bayr-hoffer seems to have taken the name from Bryologia Europaea.

⁴Engler & Prantl, Natürliche Pflanzenfamilien, I, III, 386. 1902.

⁵Mitten (Journ. Linn. Soc., Bot., XII, 131. 1869) had recorded it from Bolivia as well as Ecuador.

⁶The combination *H. subacaule* seems to go back to Paris, Index Bryologicus, 596 (1895), though not so credited by Brotherus. The other combination *H. abbreviatum* is on the other hand accepted by Paris in his second edition, II, 356 (1904) after he had included the species with *Systegium* (= *Astomum*) in his first edition, 1258 (1897). The combination *Astomum subacaule* was made by Jaeger, Musci Cleistocarpi, 13 (1869).